Special Relays

In This Appendix:

DL05 PLC Special Relays D–2

DL05 PLC Special Relays

"Special Relays" are contacts which are set by the CPU operating system to indicate a particular system event has occurred. These contacts are available for use in your ladder program. Knowing just the right special relay contact to use for a particular situation can save a lot of programming time. Since the CPU operating system sets and clears special relay contacts, the ladder program only has to use them as inputs in ladder logic.

Startup and Real Time Relays		
SP0	First scan	On for the first scan after a power cycle or program to run transition only. The relay is reset to off on the second scan. It is useful where a function needs to be performed only on program startup.
SP1	Always ON	Provides a contact to insure an instruction is executed every scan.
SP2	Always OFF	Provides a contact that is always off.
SP3	1 minute clock	On for 30 seconds and off for 30 seconds.
SP4	1 second clock	On for 0.5 second and off for 0.5 second.
SP5	100 ms clock	On for 50 ms. and off for 50 ms.
SP6	50 ms clock	On for 25 ms. and off for 25 ms.
SP7	Alternate scan	On every other scan.

CPU Status Relays		
SP11	Forced run mode	On when the mode switch is in the run position and the CPU is running.
SP12	Terminal run mode	On when the CPU is in the run mode.
SP13	Test run mode	On when the CPU is in the test run mode.
SP15	Test stop mode	On when the CPU is in the test stop mode.
SP16	Terminal PGM mode	On when the mode switch is in the TERM position and the CPU is in program mode.
SP17	Forced stop	On when the mode switch is in the STOP position.
SP20	Forced stop mode	On when the STOP instruction is executed.
SP22	Interrupt enabled	On when interrupts have been enabled using the ENI instruction.

System Monitoring		
SP36	Override setup relay	On when the override function is used.
SP37	Scan controller	On when the actual scan time runs over the prescribed scan time.
SP40	Critical error	On when a critical error such as I/O communication loss has occurred.
SP41	Warning	On when a non critical error has occurred.
SP42	Diagnostics error	On when a diagnostics error or a system error occurs.
SP44	Program memory error	On when a memory error such as a memory parity error has occurred.
SP45	I/O error	On when an I/O error such as a blown fuse occurs.
SP46	Communication error	On when a communication error occurs on any of the CPU ports.
SP50	Fault instruction	On when a Fault Instruction is executed.
SP51	Watch Dog timeout	On if the CPU Watch Dog timer times out.
SP52	Grammatical error	On if a grammatical error has occurred either while the CPU is running or if the syntax check is run. V7755 will hold the exact error code.
SP53	Solve logic error	On if CPU cannot solve the logic.
SP54	Communication error	On when RX, WX, RD, WT instructions are executed with the wrong parameters.
SP56	Table instruction overrun	On if a table instruction with a pointer is executed and the pointer value is outside the table boundary.

Accumulator Status		
SP60	Value less than	On when the accumulator value is less than the instruction value.
SP61	Value equal to	On when the accumulator value is equal to the instruction value.
SP62	Greater than	On when the accumulator value is greater than the instruction value
SP63	Zero	On when the result of the instruction is zero (in the accumulator.)
SP64	Half borrow	On when the 16 bit subtraction instruction results in a borrow.
SP65	Borrow	On when the 32 bit subtraction instruction results in a borrow.
SP66	Half carry	On when the 16 bit addition instruction results in a carry.
SP67	Carry	On when the 32 bit addition instruction results in a carry.
SP70	Sign	On anytime the value in the accumulator is negative.
SP71	Pointer reference error	On when the V-memory specified by a pointer (P) is not valid.
SP73	Overflow	On if overflow occurs in the accumulator when a signed addition or subtraction results in an incorrect sign bit.
SP75	Data error	On if a BCD number is expected and a non–BCD number is encountered.
SP76	Load zero	On when any instruction loads a value of zero into the accumulator.

HSIO Pulse Output Relay		
SP104	Profile Complete	On when the pulse output profile is completed. (Mode 30)

Communication Monitoring Relay		
SP116	CPU port busy Port 2	On when port 2 is the master and sending data.
SP117	Communication error Port 2	On when port 2 is the master and has a communication error.
SP120	Communication busy	Option card slot
SP121	Communication error	Option card slot

Equal Relays for HSIO Mode 10 Counter Presets		
SP540	Current = target value	On when the counter current value equals the value in V2320 / V2321.
SP541	Current = target value	On when the counter current value equals the value in V2322 / V2323.
SP542	Current = target value	On when the counter current value equals the value in V2324 / V2325.
SP543	Current = target value	On when the counter current value equals the value in V2326 / V2327.
SP544	Current = target value	On when the counter current value equals the value in V2330 / V2331.
SP545	Current = target value	On when the counter current value equals the value in V2332 / V2333.
SP546	Current = target value	On when the counter current value equals the value in V2334 / V2335.
SP547	Current = target value	On when the counter current value equals the value in V2336 / V2337.
SP550	Current = target value	On when the counter current value equals the value in V2340 / V2341.
SP551	Current = target value	On when the counter current value equals the value in V2342 / V2343.
SP552	Current = target value	On when the counter current value equals the value in V2344 / V2345.
SP553	Current = target value	On when the counter current value equals the value in V2346 / V2347.
SP554	Current = target value	On when the counter current value equals the value in V2350 / V2351.
SP555	Current = target value	On when the counter current value equals the value in V2352 / V2353.
SP556	Current = target value	On when the counter current value equals the value in V2354 / V2355.
SP557	Current = target value	On when the counter current value equals the value in V2356 / V2357.
SP560	Current = target value	On when the counter current value equals the value in V2360 / V2361.
SP561	Current = target value	On when the counter current value equals the value in V2362 / V2363.
SP562	Current = target value	On when the counter current value equals the value in V2364 / V2365.
SP563	Current = target value	On when the counter current value equals the value in V2366 / V2367.
SP564	Current = target value	On when the counter current value equals the value in V2370 / V2371.
SP565	Current = target value	On when the counter current value equals the value in V2372 / V2373.
SP566	Current = target value	On when the counter current value equals the value in V2374 / V2375.
SP567	Current = target value	On when the counter current value equals the value in V2376 / V2377.